(i) Fill the Flexible Bulk Container to 95% full with a material representative of the product to be shipped.

(ii) Suspend the Flexible Bulk Container by its lifting devices.

(iii) Apply a constant downward force through a specially designed platen. The platen will be a minimum of 60 percent and a maximum of 80 percent of the cross sectional surface area of the Flexible Bulk Container.

(iv) The combination of the mass of the filled Flexible Bulk Container and the force applied through the platen must be a minimum of six times the maximum net mass of the Flexible Bulk Container. The test must be conducted for a period of five minutes.

(v) Other equally effective methods of top lift testing and preparation may be used with approval of the Associate Administrator.

(d) *Criteria for passing the test.* For all Flexible Bulk Containers design types designed to be lifted from the top, there may be no damage to the Flexible Bulk Container or its lifting devices that renders the Flexible Bulk Container unsafe for transport, and no loss of contents.

§ 178.1055 Stacking test.

(a) *General.* The stacking test must be conducted for the qualification of all Flexible Bulk Containers design types.

(b) *Special preparation for the stacking test.* All Flexible Bulk Containers design types must be loaded to their maximum permissible gross mass.

(c) *Test method.* (1) All Flexible Bulk Containers must be placed on their base on level, hard ground and subjected to a uniformly distributed superimposed test load that is four times the design type maximum gross weight for a period of at least twenty-four hours.

(2) For all Flexible Bulk Containers, the load must be applied by one of the following methods:

(i) Four Flexible Bulk Containers of the same type loaded to their maximum permissible gross mass and stacked on the test Flexible Bulk Container;

(ii) The calculated superimposed test load weight loaded on either a flat plate or a reproduction of the base of the Flexible Bulk Container, which is stacked on the test Flexible Bulk Container.

(d) *Criteria for passing the test.* There may be no deterioration that renders the Flexible Bulk Container unsafe for transportation and no loss of contents during the test or after removal of the test load.

§ 178.1060 Topple test.

(a) *General.* The topple test must be conducted for the qualification of all Flexible Bulk Containers design types.

(b) *Special preparation for the topple test.* Flexible Bulk Container design types must be filled to their maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* Samples of all Flexible Bulk Container design types must be toppled onto any part of its top by lifting the side furthest from the drop edge upon a rigid, non-resilient, smooth, flat and horizontal surface. This test surface must be large enough to be immovable during testing and sufficiently large enough to ensure that the test Flexible Bulk Container falls entirely upon the surface. The test surface must be kept free from local defects capable of influencing the test results.

(d) *Topple height.* (1) For all Flexible Bulk Containers, topple heights are specified as follows: Packing group III: 0.8 m (2.6 feet).

(e) *Criterion for passing the test.* For all Flexible Bulk Container design types there may be no loss of the filling substance. However a slight discharge (e.g., from closures or stitch holes) upon impact is not considered a failure of the Flexible Bulk Container.

§ 178.1065 Righting test.

(a) *General.* The righting test must be conducted for the qualification of all Flexible Bulk Containers design types designed to be lifted from the top or side.

(b) *Special preparation for the righting test.* Flexible Bulk Container design types must be filled to not less than 95% of their capacity and to their maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* A sample Flexible Bulk Container design type must be tested; the Flexible Bulk Container

should start lying on its side and then must be lifted at a speed of at least 0.1m/s (0.328 ft/s) to an upright position clear of the floor, by no more than half of the lifting devices.

(d) *Criterion for passing the test.* For all Flexible Bulk Container design types there must be no damage that renders the Flexible Bulk Container unsafe for transport or handling.

§ 178.1070 Tear test.

(a) *General.* The tear test must be conducted for the qualification of all of Flexible Bulk Containers design types.

(b) *Special preparation for the tear test.* Flexible Bulk Container design types must be filled its maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* (1) A Flexible Bulk Container design type must be placed on the ground and a 300 mm (11.9 in) cut shall be made. This 300 mm (11.9 in) cut must:

(i) Completely penetrate all layers of the Flexible Bulk Container on a wall with a wide face.

(ii) Be made at a 45° angle to the principal axis of the Flexible Bulk Container, halfway between the bottom surface and the top level of the contents.

(2) The Flexible Bulk Container after being cut according to the provisions of §178.1070(c)(1), must be subjected to a uniformly distributed superimposed load equivalent to twice the maximum gross mass of the package. This load must be applied for at least fifteen minutes. Flexible Bulk Containers that are designed to be lifted from the top or the side must, after removal of the superimposed load, be lifted clear of the floor and maintained in that position for a period of fifteen minutes.

(d) *Criterion for passing the test.* For all Flexible Bulk Container design types, the cut must not spread more than an additional 25% of its original length.

APPENDIX A TO PART 178—SPECIFICATIONS FOR STEEL

TABLE 1

[Open-hearth, basic oxygen, or electric steel of uniform quality. The following chemical composition limits are based on ladle analysis:]

Designation	Chemical composition, percent-ladle analysis		
	Grade 1[1]	Grade 2[1 2]	Grade 3[2 4 5]
Carbon	0.10/0.20	0.24 maximum	0.22 maximum.
Manganese	1.10/1.60	0.50/1.00	1.25 maximum.
Phosphorus, maximum	0.04	0.04	0.045.[6]
Sulfur, maximum	0.05	0.05	0.05.
Silicon	0.15/0.30	0.30 maximum	
Copper, maximum	0.40		
Columbium		0.01/0.04	
Heat treatment authorized	([3])	([3])	([3]).
Maximum stress (p.s.i.)	35,000	35,000	35,000.

[1] Addition of other elements to obtain alloying effect is not authorized.
[2] Ferritic grain size 6 or finer according to ASTM E 112–96 (IBR, see § 171.7 of this subchapter).
[3] Any suitable heat treatment in excess of 1,100 °F., except that liquid quenching is not permitted.
[4] Other alloying elements may be added and shall be reported.
[5] For compositions with a maximum carbon content of 0.15 percent of ladle analysis, the maximum limit for manganese on ladle analysis may be 1.40 percent.
[6] Rephosphorized Grade 3 steels containing no more than 0.15 percent phosphorus are permitted if carbon content does not exceed 0.15 percent and manganese does not exceed 1 percent.

CHECK ANALYSIS TOLERANCES

[A heat of steel made under any of the above grades, the ladle analysis of which is slightly out of the specified range is acceptable if the check analysis is within the following variations:]

Element	Limit or maximum specified (percent)	Tolerance (percent) over the maximum limit or under the minimum limit	
		Under minimum limit	Over maximum limit
Carbon	To 0.15 inclusive	0.02	0.03